
GENERAL STUIDES (P)

Q 1.D

- **Positive liberty** is the possibility of acting — or the fact of acting — in such a way as to take control of one's life and realize one's fundamental purposes.
- **Negative liberty** is the absence of external obstacles, barriers or constraints.
- While negative liberty is usually attributed to individual agents, positive liberty is sometimes attributed to collectivities, or to individuals considered primarily as members of given collectivities. In its political form, positive freedom has often been thought of as necessarily achieved through a collectivity.
- **Negative Liberty in the Indian Constitution:**
 - **Article 14** states that “*State shall not deny to any person equality before the law or the equal protection of the laws within the territory of India.*” In this article, the constitution has put an obligation overstate to ensure equality before the law and equal protection of the law. Thus, it is negative in nature.
 - **Article 21:** Protection of life and personal liberty "*No person shall be deprived of his life or personal liberty except according to the procedure established by law*". This again puts an obligation on states to not deprive a person of his/her life and personal liberty. The event could be attributed to negative liberty.
 - **Article 22(1)** Protection against arrest and detention in certain cases: *No person who is arrested shall be detained in custody without being informed, as soon as may be, of the grounds for such arrest nor shall he be denied the right to consult, and to be defended by, a legal practitioner of his choice*
- **Positive rights or liberty are those which confer certain privileges on the person or community.** For example, Right to religious freedom (Article 25-28) and cultural and educational right (Article 29-30). These rights confer certain special provisions for protection and upliftment of minorities. Thus, these are called positive rights.
 - **Article 25 (1)** Freedom of conscience and free profession, practice and propagation of religion: Subject to public order, morality and health and to the other provisions of this Part, all persons are equally entitled to freedom of conscience and the right freely to profess, practice and propagate religion. This statement confers privilege upon a person to carry out his religious affairs, thus this could be seen as a positive concept of rights.
 - **Article 16:** Equality of opportunity in matters of public employment : (1) There shall be equality of opportunity for all citizens in matters relating to employment or appointment to any office under the State

Q 2.D

- **Domestic Gas Sources:** The domestic gas in the country is being supplied from the oil & gas fields located in western and southeastern areas viz. Hazira basin, Mumbai offshore & KG basin as well as the North East Region (Assam & Tripura).
- Recently the International Energy Agency (IEA) has slammed India's natural gas pricing policy, saying linking domestic production to very low global reference prices has reduced incentives for producers to raise supplies. **Currently, the price of domestically produced natural gas is fixed by a formula that averages out rates in gas surplus nations such as Russia and the US. Hence statement 1 is not correct.**
- **Natural Gas in India does not fall within the purview of GST.** When the Goods and Services Tax was introduced on July 1, 2017, amalgamating 17 central and state levies, five commodities namely crude oil, natural gas, petrol, diesel, and aviation turbine fuel were kept out of its purview given the revenue dependence of state governments on this sector. Currently, natural gas is taxed under the VAT regime with VAT ranging from 3 percent to 20 percent across states. **Hence statement 2 is not correct.**
- The IEA said for the share of environment-friendly fuel to rise, the government needs to ensure gas is treated on a level playing field with other fuels for taxation and is included under the Goods and Services

Tax (GST). Bringing natural gas under the ambit of goods and services tax (GST) will not only make transport of the fuel across the country more efficient but also facilitate setting up of the much-discussed domestic gas trading hub.

- **With stagnant domestic output, India meets half of its gas needs through imports.** Russia is one of the major countries to begin supplying long-term LNG to India after the United States, Australia, and Qatar. **Hence statement 3 is not correct.** In order to meet the gas demand, Liquefied Natural Gas (LNG) is imported through Open General License (OGL) in the country and it is imported by the gas marketer under various Long Term, Medium Term, and Spot contracts. The price and utilization of imported LNG are mutually decided by buyers and sellers. The price of the Natural Gas according to this formula currently is USD 3.23 per million British thermal units, half of what India pays for import of liquefied natural gas (LNG).
- **National Gas Grid:** At present, there are about 16800 km long Natural Gas pipeline network which is operational in the country. In order to make available natural gas across the country, it has been envisaged to develop an additional about 14,300 km pipelines to complete the National Gas Grid. To promote the development of City Gas Distribution Network, the Government has accorded the priority in domestic gas allocation to PNG (Domestic) and CNG (Transport) segments. It has been decided to meet 100% gas requirement of CNG (T) and PNG(D) segments through the supply of domestic gas which is cheaper than imported gas. The India National Gas Grid Technical Assistance program stems from an agreement in September between PNGRB and the United States Trade Development Agency (USTDA).

Q 3.C

- The Wetlands (Conservation and Management) Rules, 2017 shall apply to the following wetlands or wetlands complexes, namely:—
 - wetlands categorised as 'wetlands of international importance' under the Ramsar Convention;
 - wetlands as notified by the Central Government, State Government and Union Territory Administration;
- **Provided that these rules shall not apply to the wetlands falling in areas covered under** the Indian Forest Act, 1927, the **Wildlife (Protection) Act, 1972**, the Forest (Conservation) Act, 1980, the State Forest Acts, and the Coastal Regulation Zone Notification, 2011 as amended from time to time.
- All wetlands, irrespective of their location, size, ownership, biodiversity, or ecosystem services values, can be notified under the Wetlands Rules, **except:**
 - **River channels;**
 - **Paddy fields;**
 - Human-made waterbodies specifically constructed for drinking water purposes;
 - Human-made waterbodies specifically constructed for aquaculture purposes;
 - Human-made waterbodies specifically constructed for salt production purposes;
 - Human-made waterbodies specifically constructed for recreation purposes;
 - Human-made waterbodies specifically constructed for irrigation purposes;
 - Wetlands falling within areas covered under the Indian Forest Act, 1927; Forest (Conservation) Act, 1980; State Forest Acts and amendments thereof;
 - Wetlands falling within areas covered under the Wildlife (Protection) Act, 1972 and amendments thereof;
 - Wetlands falling within areas covered under the Coastal Regulation Zone Notification, 2011 and amendments thereof.

Q 4.C

- In order to promote and encourage the use of biogas as clean cooking fuel, the earlier scheme, National Biogas and Manure Management Programme (NBMMP) was modified and is now being implemented as New National Biogas and Organic Manure Programme (NNBOMP) from 1st April 2018. The Rural Development Departments of the State Governments or UT Administrations have been designated as the main Programme Implementing Agencies.
- It is a Central Sector Scheme and is being implemented with the objective:
 - **To provide clean cooking fuel for kitchens, lighting and meeting other thermal and small power needs of farmers/dairy farmers /users including individual households and to improve organic manure system (not eliminate chemical fertilizer) based on bio-slurry from biogas plants in rural and semi-urban areas by setting up of small size biogas plants of 1 to 25 Cubic Metre capacity. Hence statements 1 and 2 are correct and statement 3 is not correct.**
 - To mitigate drudgery of women and time saving for them for other livelihood activities and reduce pressure on forests and accentuate social benefits;

- To improve sanitation in rural and semi-urban areas including linking sanitary toilets with cattle dung biogas plants;
- To provide biogas plant produced slurry (liquid / semi-solid or dried) as an organic enriched bio-manure to help reduce use of chemical fertilizers such as urea, linking biogas slurry with enrichment units such as vermicomposting, Phosphate Rich Organic Manure (PROM) plants and other organic enrichment facilities as a source of value addition to bio gas plant slurry.
- To meet 'lifeline energy' needs for clean cooking as envisaged in "Integrated Energy Policy" of NITI Aayog (erstwhile Planning Commission).
- **To help in combating and reduction in causes of climate change by preventing emissions of Green House Gases (GHGs) such as carbon dioxide. Hence statement 4 is correct.**

Q 5.D

- The term RNA interference (RNAi) was coined to describe a cellular mechanism that uses the gene's own DNA sequence of the gene to turn it off, a process that **researchers call silencing**. In a wide variety of organisms, including animals, plants, and fungi, RNAi is triggered by double-stranded RNA (dsRNA). **Hence option (d) is the correct answer.**
- During RNAi, long dsRNA is cut or "diced" into small fragments ~21 nucleotides long by an enzyme called "Dicer". These small fragments referred to as small interfering RNAs (siRNA), bind to proteins from a special family: the Argonaute proteins.
- RNAi is widely used by researchers to silence genes in order to learn something about their function. siRNAs can be designed to match any gene, can be manufactured cheaply, and can be readily administered to cells. One can now order commercially synthesized siRNAs to silence virtually any gene in a human or other organism's cell, dramatically accelerating the pace of biomedical research. Furthermore, the ability to turn off the expression of a single gene makes RNAi an appealing therapeutic approach to treat infectious diseases or genetic disorders, such as those that result from the inappropriate and undesirable activity of a gene, as in many cancers and neurodegenerative diseases. There are currently several clinical trials testing the safety and effectiveness of siRNA drugs.

Q 6.C

- The period that followed Rig Vedic Age is known as the Later Vedic Age. It spanned from c. 1000 – c. 600 BCE.
- **Statement 1 is not correct:** The Vedic communities had developed neither a taxation system nor a professional army. There did not exist collectors of taxes apart from the kinsmen of the prince.
- **Statement 2 is correct:** The peasantry in the later Vedic times was called *bala (force)*. The army to protect the asvamedha horse comprised both the kshatriyas and the vis. Although the nobles and warriors ruled over their peasant kinsmen, they **had to depend upon peasant militia for fighting against enemies and they could not grant land without the consent of the peasantry**. All this placed them in a difficult position and could not sharpen the distinctions between the rulers and the ruled.
- **Statement 3 is not correct: The mode of worship changed considerably in the Later Vedic period. Prayers were recited, but they ceased to be the dominant mode of worship. Instead, sacrifices became far more important. They had both a public and a private character.** Public sacrifices involved the king and the whole of the community while private sacrifices were performed by individuals in their houses because in this period the people led a settled life and maintained well-established households. Sacrifices involved the killing of animals on a large scale and especially the destruction of cattle wealth.
- During the later Vedic period, the emergence of Rajan as the wielder of supreme political power involved his distancing himself from those closest to him – his kinsmen. This distancing was emphasized in ritualized contests such as the chariot race in the *vajpeya sacrifice (meant to re-establish a king's supremacy over his people)*, and the cattle raid and game of dicing in the *rajasuya sacrifice*.
- Other important Vedic rituals:
 - **Asvamedha:** Horse sacrifice meant to establish a king's supremacy over other kings.
 - **Semontonnayam:** A ceremony to ensure the safety of the child in the womb.
 - **Jatkarma:** A birth ceremony performed before the cutting of the umbilical cord.
 - **Upanayana:** An initiation ceremony to confer status to boys of the higher varnas in their eighth year.

Q 7.B

- A virus is a small parasite that cannot reproduce by itself. Once it infects a susceptible cell, however, a virus can direct the cell machinery to produce more viruses. **Most viruses have either RNA or DNA as their genetic material (but no virus can have both).** The nucleic acid may be single- or double-

stranded. The entire infectious virus particle, called a virion, consists of the nucleic acid and an outer shell of protein. The simplest viruses contain only enough RNA or DNA to encode four proteins. The most complex can encode 100 – 200 proteins. **Hence statement 1 is correct.**

- Viruses can cause both Viral hemorrhagic fevers (VHFs) and cancers. When viruses cause an infection, they spread their DNA, affecting healthy cells' genetic makeup and potentially causing them to turn into cancer. HPV (Human Papillomavirus) infections, for instance, cause the virus' DNA to combine with the host's DNA, disrupting the normal function of cells. **Hence statement 2 is correct.**
- **Antivirals are a class of medications that are used to treat viral infections.** Most viral infections resolve spontaneously in immunocompetent (having a normal immune response) individuals. The aim of antiviral therapy is to minimize symptoms and infectivity as well as to shorten the duration of illness. These drugs act by arresting the viral replication (or multiplication) cycle at various stages. Currently, antiviral therapy is available only for a limited number of infections. Most of the antiviral drugs currently available are used to treat infections caused by HIV, herpes viruses, hepatitis B and C viruses, and influenza A and B viruses. Because viruses are obligate, intracellular parasites, it is difficult to find drug targets that interfere with viral replication without also harming the host cells. **Unlike other antimicrobials (antibiotics), antiviral drugs do not deactivate or kill the microbe (in this case, the virus) but act by inhibiting replication. Hence statement 3 is not correct.**

Q 8.A

- **Surendranath Banerjea was 1869-batch ICS officer but he was dismissed from the service**, on the flimsy ground in 1874. After that, he came to the arena of public life and began to participate in 'public life' in Kolkata.
- In 1876, **he along with Ananda Mohan Bose founded a political association 'Indian Association' in Kolkata.** The Indian Association was the most important of pre-Congress associations and aimed to promote by every legitimate means the political, intellectual and material advancement of the people.
- During 1905-11 he took a leading part in the Bengal anti-partition movement but opposed boycott and acts of violence. He was a champion of local self-government and founder of Ripon College (now Surendranath College).
- **He became a member of the Imperial Legislative Assembly in 1921 and was knighted the same year.**

Q 9.B

- In pursuance of the announcement made in the Union Budget 2014-15, RBI in 2014 has issued draft guidelines for setting up Small Finance Banks in the private sector. The small finance bank shall be registered as a public limited company under the Companies Act, 2013. Small Finance Banks will be licensed under Section 22 of the Banking Regulation Act, 1949 and governed by the provisions of the Banking Regulation Act, 1949; Reserve Bank of India Act, 1934, etc. **Hence, statement 1 is correct.**
- The objectives of setting up of small finance banks will be for furthering financial inclusion by
 - Provision of savings vehicles primarily to unserved and underserved sections of the population
 - Supply of credit to small business units; small and marginal farmers; micro and small industries; and other unorganized sector entities, through high technology-low cost operations
- SFBs can be set up by Resident individuals/professionals, singly or jointly, each having at least 10 years of experience in banking and finance at a senior level; and Companies and Societies in the private sector, that are owned and controlled by residents, and having a successful track record of running their businesses for at least a period of five years.
- Small finance banks will have to subject to the condition that the **requirement of opening at least 25 percent of its banking outlets in unbanked rural centers** (population up to 9,999 as per the latest census). **Hence, statement 2 is correct.**
- The small finance banks shall primarily undertake basic banking activities of acceptance of deposits and lending to unserved and underserved sections including small business units, small and marginal farmers, micro and small industries and unorganized sector entities. SFBs can also undertake other non-risk sharing simple financial services activities such as the **distribution of mutual fund units, insurance products, pension products**, etc. with the prior approval of the RBI and after complying with the requirements of the sectoral regulator for such products.
- The small finance bank will be subject to all prudential norms and regulations of RBI as applicable to existing commercial banks including the requirement of maintenance of Cash Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR). **In view of the objectives for which small finance banks are set up, the bank will be required to extend 75 percent of its Adjusted Net Bank Credit (ANBC) to the sectors eligible for classification as priority sector lending (PSL) by RBI.**

- Recently RBI allowed **Payments Banks to apply for conversion into SFBs** after five years of operations if they are otherwise eligible as per these guidelines. **Hence, statement 3 is not correct.**

Q 10.C

- **Statement 1 is not correct:** Sikkim and Meghalaya are the only two states in India which are bordered by just one Indian state each. Meghalaya is **surrounded by Assam to its north** and Bangladesh to its south. The fact remains that a major part of the border of the state is situated on the north and eastern part of Assam. The south and west part are with Bangladesh. Sikkim is bordered by the Tibet Autonomous Region of China to the north and northeast, by Bhutan to the southeast, **by the Indian state of West Bengal to the south**, and by Nepal to the west. Thus Sikkim is bordered by just one Indian state which is West Bengal while Meghalaya is bordered only by Assam. Goa, on the other hand, is bordered by both Maharashtra and Karnataka.
- **Statement 2 is correct:** 82° 30' East is the Indian Standard Meridian, it passes through Mirzapur in Uttar Pradesh and touches five states of India. The states it passes through are Uttar Pradesh, **Madhya Pradesh, Chhattisgarh**, Orissa, and Andhra Pradesh. Tropic of Cancer passes through Mizoram, Tripura, West Bengal, Jharkhand, **Chhattisgarh, Madhya Pradesh**, Rajasthan, and Gujarat. Thus Chhattisgarh and Madhya Pradesh are the only two states through which both the lines pass.
- **Statement 3 is correct:** Jammu and Kashmir is not a state anymore. West Bengal also shares its borders with three countries because of its narrow northward extension. Those countries are-Bangladesh to the East and Nepal and Bhutan in the North. Punjab Rajasthan and Gujarat share borders only with Pakistan. Assam shares international borders with Bangladesh and the Kingdom of Bhutan. Arunachal Pradesh shares international borders with Bhutan in the west, Myanmar in the east, and a disputed border with China in the north at the McMahon Line.

Q 11.C

- The **Asur tribe** has been using mobile radio to transmit local news and songs which is helping them revive the dying tribal language.
- **About Asur Tribe**
 - Asur Tribe is an Austroasiatic ethnic group living primarily in the Indian **state of Jharkhand**. They are included in the list of Particularly Vulnerable Tribal Groups (PVTG's).
 - The main **festival** of the tribe includes Sarhul, Phagua, Navakhans among others.
 - As per the 2011 census, the tribe has a population of around 23,000 in Latehar and Gumla districts.
 - In the community, 50% of the population could barely speak in Asur language; they are not fluent in the language.
 - The Asur language figures in the list of UNESCO Interactive Atlas of the World's Languages in Danger.
 - Only 7,000 to 8,000 Asur tribals are left in the community who are well conversant in the language.

Q 12.A

- The number of animals in a population is conventionally estimated by capture-recapture without modeling the spatial relationships between animals and detectors. Problems arise with non-spatial estimators when individuals differ in their exposure to traps or the target population is poorly defined. **Spatially explicit capture-recapture (SECR) methods** devised recently to estimate population density largely avoid these problems. Spatially explicit capture-recapture (SECR) models have gained enormous popularity to solve abundance estimation problems in ecology.
- **Extract compare** is Conservation Research Ltd's software designed to **automatically identify individual animals** from their natural markings. It uses still photos were taken by researchers, tourists or camera traps and is applicable to any species with natural markings.
- In India, **tiger faeces** were used for genetic sampling and estimating the big cats' population for the **2018 Tiger Census**. The experiment was called '**scats**' and it was conducted for the first time in **uneven terrains**. The **camera traps** were also used in tiger estimation.
- In addition to the above **M-STripES (Monitoring System For Tigers-Intensive Protection and Ecological Status)** is the other application software used for tiger estimation.

Q 13.B

- **Statement 1 is not correct:** CGA works under the Ministry of Finance, Government of India. Though it itself is not a constitutional body, it derives its mandate from Article 150 of the Constitution which says: "**The accounts of the Union and of the States shall be kept in such form as the President may, on the**

advice of the Comptroller and Auditor-General of India, prescribe". Thus while CAG (Comptroller and Auditor General of India) is an independent constitutional body, CGA works under the Ministry of Finance and not a constitutional body.

- **Statement 2 is correct:** It is the principal account adviser or the apex accounting authority of the Union Government. Its statutory mandate (duties and functions) have been defined in the Allocation of Business Rules, 1961
- Matters relating to the Controller General of Accounts include-
 - general principles of Government accounting relating to Union or State Governments and form of accounts, and framing or revision of rules and manuals relating thereto;
 - reconciliation of cash balance of Union Government with Reserve Bank in general and, in particular, of Reserve Deposits pertaining to Civil Ministries or Departments;
 - overseeing the maintenance of adequate standards of accounting by Central Civil Accounts Offices;
 - consolidation of monthly accounts, preparation of the review of trends of revenue realization and significant features of expenditure, etc. and preparation of annual accounts (including Summary, Civil Appropriation Accounts) showing under the respective heads, the annual receipts and disbursements for the purpose of the Union Government;
 - administration of Central Treasury Rules and Central Government Account (Receipts and Payments Rules 1983);
 - coordination and assistance in the Introduction of management accounting system in Civil Ministries or Departments;(g) cadre management of Group 'A' (Indian Civil Accounts Service) and Group 'B' Officers of the Central Civil Accounts Offices;
 - matters relating to the Central Civil Accounts staff belonging to Group 'C' and 'D';
 - disbursement of Pension through Public Sector Banks (PSBs) in respect of Central Civil Pensioners, Freedom Fighters, High Court Judges, Ex-M.P.s and Ex-Presidents.
- **Statement 3 is not correct:** The CAG is also the head of the Indian Audit and Accounts Department, the affairs of which are managed by officers of Indian Audit and Accounts Service.

Q 14.D

- In the healthcare setting, “alcohol” refers to two water-soluble chemical compounds—**ethyl alcohol and isopropyl alcohol**—that have generally underrated germicidal characteristics. These alcohols are rapidly **bactericidal (bacteria-killing)** rather than **bacteriostatic (which stops bacteria from reproducing or multiplying)** against vegetative forms of bacteria; they also are tuberculocidal, fungicidal, and virucidal but do not destroy bacterial spores. Their cidal activity drops sharply when diluted below 50% concentration, and the optimum bactericidal concentration is 60%–90% solutions in water (volume/volume). Methyl alcohol (methanol) has the weakest bactericidal action of the alcohol and thus seldom is used in healthcare. Also, methanol is highly toxic, and severe systemic toxicity and even deaths can occur after oral, pulmonary and/or skin exposures. **Hence statement 2 is not correct.**
- The most feasible explanation for the antimicrobial action of alcohol (or alcohol-based sanitizers) is the **denaturation of proteins**. This mechanism is supported by the observation that absolute ethyl alcohol, a dehydrating agent, is less bactericidal than mixtures of alcohol and water because proteins are denatured more quickly in the presence of water. In simple words, Ethyl alcohol (also called ethanol) kills bacteria **by dissociating/dissolving (and not vaporize)** the bacteria's cellular membrane. The way ethanol dissolves a cell membrane is by having one end that **dissolves** well in water (the one with the OH) and the other end that dissolves well in fatty/greasy like substances (the end with the CH₂CH₃). Bacteria cell membranes are like water on the outside and like fat on the inside, so when you apply ethanol to a cell membrane, instead of all the parts of the membrane sticking together, they'll associate with the ethanol causing the membrane to fall apart. **Hence statement 1 is not correct.**

Q 15.C

Nayanars	Alvars
The Nayanars were a group of 63 saints in the 6th - 8th century who were devoted to the Hindu god Shiva in Tamil Nadu.	It was a group of 12 saints devoted to Vishnu
The best-known Nayanar saints were Appar, Sambandar, Sundarar, and Manikkavasagar.	The best known Alvar saints were Periyalvar, his daughter Andal, Tondaradippodi Alvar and Nammalvar.
There are two sets of compilations of their songs - Tevaram and Tiruvakam.	Their compositions are compiled in an anthology known as the <i>Nalayira Divyaprabandham</i> ("Four Thousand Sacred Compositions"). It has been compiled in its present form by Nathamuni during the 9th - 10th centuries.

• **Additional Information:**

- Shaivism emerged as a 'state' cult under Rajaraja I (A.D 985-1045.), Rajendra I and Kulottunga II (A.D.1133-50.). The large-scale construction of the Shaiva temples, especially in the royal capital of Gangaichondacholapuram and Tanjavur projected the Chola policy of promoting Shaiva bhakti. The collection of the Shaiva hymns and the composition of the hagiographies were a part of the royal project that contributed to the evolution of a Shaiva scripture (marai). **Nambi Andar Nambi, the compiler of the Thirumurai (the Shaiva scripture)** and Cekkilar, the composer of the Shaiva hagiography, the **Periya Puranam**, were associated with the court of Rajaraja I and Kulottunga II respectively.
- **About Thirumai:** It is a **twelve volume compendium of songs or hymns in praise of Shiva** in the Tamil language from the 6th to the 11th century by various poets in South India.
 - ✓ **Nambi Andar Nambi compiled the first seven volumes by Appar, Sampandhar, and Sundarar as Tevaram during the 12th century.**
 - ✓ **Tiruvacakam and Tirukovayar by Manickavasagar are included as the eighth, nine parts are compiled as the ninth Tirumurai** out of which most are unknown.
 - ✓ **Tenth as Tirumandiram by Tirumular, the famous Siddhar.**
 - ✓ The eleventh is compiled by Karaikal Ammaiyar, Cheraman Perumal and others.

Q 16.B

- When the government is going to the financial market to raise money, it can do it by issuing two types of debt instruments – **treasury bills and government bonds**. Treasury bills are issued when the government needs money for a shorter period while bonds are issued when it need debt for more than say five years.
- Treasury bills generally shortened as T-bills, **have a maximum maturity of 364 days**. Hence, they are categorized as **money market instruments** (money market deals with funds with a maturity of less than one year).
- Zero-coupon **security is a debt security that does not pay interest but instead trades at a deep discount**, rendering a profit at maturity, when the bond is redeemed for its full face value. **Treasury bills are regarded as zero-coupon securities as they pay no interest**. Rather, they are issued at a discount (at a reduced amount) and redeemed (given back money) at the face value at maturity. **Hence option (b) is the correct answer.**
- Treasury bills are presently issued in three maturities, namely, **91 days, 182 days and 364 days**.
- The return to the investors is the difference between the maturity value or the face value and the issue price.
- The regular Treasury bills have **no inflation protection but** Treasury Inflation-Protected Securities (TIPS) do.

Q 17.B

- **The Belgaum border dispute is a dispute involving the Indian states of Karnataka and Maharashtra.** Belgaum is a part of Karnataka and was earlier part of the British India's Bombay Presidency. The Bombay Presidency encompassed present-day Gujarat, Maharashtra as well as certain areas of North Karnataka. **Hence pair 1 is not correctly matched.**
- Assam and Meghalaya are two states embroiled in a border dispute for decades now. It first started when Meghalaya challenged the Assam Reorganisation Act of 1971, which gave part of the Mikir Hills to

Assam, which according to Meghalaya, are part of United Khasi and Jaintia Hills. **Langpih - or Lumpi, as it called in Assam - has been a bone of contention between the two north-eastern neighbours for decades. Meghalaya claims it to be part of West Khasi Hills district, while Assam asserts that it falls under its Kamrup district. Hence pair 2 is correctly matched.**

- **The dispute between Gujarat and Rajasthan relates to Mangadh Hill, located on the border of the two states. Gujarat claims half of the hill, while Rajasthan claims the entire hill.** The dispute is 40-year-old, though the Rajasthan Government presently has control over it. The Panchmahal district administration of Gujarat recently started constructing a road to reach the hill, along with forest huts and hand pumps for the pilgrims. The Rajasthan government has raised strong objections to this. **Hence pair 3 is correctly matched.**

Q 18.A

A Few Important Features of the Act are:

- It ended the British rule in India and declared India as an independent and sovereign state from August 15, 1947.
- It provided for the partition of India and the creation of two independent Dominions of India and Pakistan with the right to secede from the British Commonwealth.
- It deprived the British Monarch of his right to veto bills or ask for a reservation of certain bills for his approval. But, this right was reserved for the Governor-General. The Governor-General would have full power to assent to any bill in the name of His Majesty. **Hence statement 1 is correct.**
- It designated the Governor-General of India and the provincial governors as constitutional (nominal) heads of the states. They were made to act on the advice of the respective council of ministers in all matters.
- It dropped the title of Emperor of India from the royal titles of the king of England.
- It empowered the Constituent Assemblies of the two dominions to frame and adopt any constitution for their respective nations and **to repeal any act of the British Parliament, including the Independence act itself.**
- It empowered the Constituent Assemblies of both the dominions to legislate for their respective territories till the new constitutions were drafted and enforced. No Act of the British Parliament passed after August 15, 1947, was to extend to either of the new dominions unless it was extended thereto by a law of the legislature of the dominion.
- It provided for the governance of each of the dominions and the provinces by the Government of India Act of 1935, till the new Constitutions were framed. The dominions were however authorized to make modifications in the Act. **Hence statement 2 is not correct.**

Q 19.A

- A convict who is under the sentence of death is allowed to file a mercy petition within a specific period of seven days after the date on which the Superintendent of Jail informs him about the rejection of the appeal or special leave to appeal by the Supreme Court.
- The process begins with filing a mercy petition with the President under Article 72 of the Constitution. **The petition is then sent to the Ministry of Home Affairs in the Central Government for inspection.** The petition is then discussed by the Home Ministry in deliberation with the concerned State Government. After the deliberation, a suggestion is made by the Home Minister and then the petition is again sent to the President. The advice and suggestions bind the President. **Hence statement 3 is not correct.**
- **The mercy petition can be made to both president and the governor. Hence statement 2 is correct.**
- The extent of the pardoning power of the President under Article 72 is broader than the pardoning power of the Governor under Article 161. The power varies in the following two ways:
 - The power of the President to grant pardon expands in the cases where the punishment or sentence is by a Court Martial but Article 161 does not impart any such power to the Governor.
 - The President can grant pardon in all the cases where the sentence is given is a sentence of death but the pardoning power of Governor does not stretch to death sentence cases. However, the Governor can commute the death sentence to life imprisonment (**In the case of Rajiv Gandhi assassination, the Governor of Tamil Nadu had commuted the death sentence of a convict to life imprisonment**).
- The mercy petition is however upon the discretion of the president and governor and the convict cannot claim it as a right. The case of Ranga Billa in the Supreme Court was called upon to decide the nature and

ambit of the pardoning power of the President of India under Article 72 of the Constitution. In this case, the death sentence of one of the appellants was confirmed by the Supreme Court and mercy petition was also rejected by the President. Then, the appellant filed a writ petition in the Supreme Court challenging the discretion of the President to grant pardon on the ground that no reasons were provided for rejection of his mercy petition. The court rejected the petition and stated that the term “pardon” itself signifies that it is an entirely discretionary remedy and grant and the rejection of it need not be reasoned. **Hence statement 1 is correct.**

Q 20.D

- **The United Nations Conference on Trade and Development (UNCTAD)**, United Nations Department of Economic and Social Affairs (UN DESA) and the five United Nations Regional Economic Commissions have jointly released the **World Economic Situation and Prospects 2020 (WESP) recently. Hence option (d) is correct.**
- **Other Reports published by UNCTAD:**
 - Trade and Development Report
 - World Investment Report
 - The Least Developed Countries Report
 - Information and Economy Report
 - Technology and Innovation Report
 - Commodities and Development Report

Q 21.B

- PPIs are instruments that facilitate the purchase of goods and services, including financial services, remittance facilities, etc., against the value stored on such instruments. The value stored on such instruments represents the value paid for by the holders by cash, by debit to a bank account, or by credit card. **Hence, statement 1 is correct.**
- The pre-paid instruments can be issued as smart cards, magnetic stripe cards, internet accounts, internet wallets, mobile accounts, mobile wallets, paper vouchers and any such instrument which can be used to access the pre-paid amount.
- A company incorporated in India and registered under the Companies Act, 1956 / Companies Act, 2013, having a minimum paid-up capital of Rs. 5 crore and minimum positive net worth of Rs. 1 crore at all the times are permitted to issue PPIs in India.
- PPIs can be reloadable or non-reloadable. **The loading/reloading of PPIs shall be through payment instruments issued by entities regulated in India and shall be in Indian Rupees (INR) only.** Banks are permitted to issue and reload such payment instruments at their branches and ATMs against payment by cash/debit to bank account/credit card and through their business correspondents (BCs). In the case of non-reloadable PPIs, the outstanding amount in it can be transferred to a new similar PPI of the same issuer, upon expiry. **Hence, statement 2 is correct.**
- PPIs that can be issued in the country are classified under three types viz. (i) Closed System PPIs, (ii) Semi-closed System PPIs, and (iii) Open System PPIs.
 - Closed System PPIs: These are payment instruments issued by an entity for facilitating the purchase of goods and services from it. These instruments do not permit cash withdrawal or redemption. As these instruments do not facilitate payments and settlement for third party services, the issue and operation of such instruments are not classified as payment systems. Hence, RBI approval is not required for issuing them. Eg. Many of the web portals for online purchases /shopping - Make my Trip, Flipkart, Jabong, etc. run wallets for its customers. Pre-paid cards of mobile companies also belong to this category.
 - Semi-closed System PPIs: These are payment instruments that can be used for the purchase of goods and services, including financial services at a group of clearly identified merchant locations/ establishments which have a specific contract with the issuer to accept the payment instruments. These instruments do not permit cash withdrawal or redemption by the holder. Such PPIs are non-reloadable in nature; The above two can be issued only in electronic form.
 - Open System PPIs: These PPIs are issued only by banks (approved by RBI) and are used at any merchant for purchase of goods and services, including financial services, remittance facilities, etc. Cash withdrawal at ATMs / Points of Sale (PoS) terminals / Business Correspondents (BCs) are also allowed through such PPIs.
- No interest is payable on PPI balances. **Hence, statement 3 is not correct.**

Q 22.D

- **Ecological efficiency** is the amount of **energy that is transferred from one trophic level to the next**. It is defined as the energy **supply available to trophic level N + 1**, divided by the energy consumed by trophic level N. This follows the **10% rule**, which states that roughly 10% of the energy at one level will be available to be used by the next level. Hence if ecosystem A has higher ecological efficiency than B, then it means **energy transfer between trophic levels is more efficient** in ecosystem A than B. **Hence option (d) is the correct answer.**
- For example, in an ecological pyramid, producers are consumed by primary consumers. The consumers eat these producers, but only about 10% of what they consume actually becomes new biomass for the primary consumer. So if a wolf eats a deer, only 10% of what was consumed becomes new wolf biomass.

Q 23.C

- **Statement 3 is correct: Macaulay's Minutes' formed the basis for the English Education Act of 1835.** Lord Macaulay held the view that "Indian learning was inferior to European learning".
- Hence, Macaulay's 'Minute on Indian Education' proposed that the limited government resources were to be devoted to the teaching of Western sciences and literature through the medium of the English language alone.
- In his Minute he also advocated that the government try to educate only a few Indians. Thus creating a class "Indian in blood and color but English in tastes, in opinions, in morals and in intellect" who would, in turn, teach the rest of the masses. This is called the 'downward filtration' policy.
- **Statement 1 is not correct:** Macaulay's proposals were promptly accepted by the government and soon made English as the medium of instruction in its schools and colleges and opened a few English schools and colleges instead of a large number of elementary schools, thus neglecting mass education.
- The direction and the philosophy set by the Minutes were executed by the Act.
- Wood's Despatch (1854) asked the government of India to assume responsibility for the education of the masses.
- **Statement 2 is not correct: The Act did not provide the fund for the Orientalist institution for their continuation.** Instead, it stopped the promotion of Oriental institutions like Calcutta Madrasa and Benaras Sanskrit College.

Q 24.A

- The Brahmaputra, one of the largest rivers of the world, has its origin in the Chemayungdung glacier of the Kailash range near the Mansarovar lake. The Brahmaputra, a trans-boundary river, is unstable in its entire reach in Assam except for a few places and well-known for floods, channel shifting and bank erosion. This is due to the fact that most of its tributaries are large, and bring large quantity of sediments owing to heavy rainfall in its catchment area. **Hence, statement 1 is not correct and statement 2 is correct.**
- Additionally, the entire area falls in an earthquake-prone zone and experiences high rainfall. Landslides and earthquakes send in a lot of debris in the rivers, causing the river bed to rise and leading to floods. **Hence, statement 3 is correct.**

Q 25.C

- **Recently Prime Minister of India visited Kingdom of Saudi Arabia and attended Future Investment Initiative (FII) held in Riyadh.**
- **Major outcomes of the visit:**
 - **Establishment of a Strategic Partnership Council (SPC).** India has become the fourth country to sign such an agreement with Saudi Arabia. The SPC will have two parallel tracks:
 - Political, security, culture and society, headed by Foreign Ministers of both the countries;
 - Economy and investment, headed by India's Commerce Minister and Saudi's Energy Minister.
- The joint statement rejected all forms of interference in the internal affairs of countries. This is seen as Saudi Arabia's tacit support for India's decision to revoke the special status of Jammu and Kashmir.
- Both countries signed 12 MoUs on issues such as preventing narcotics trafficking, renewable energy, security collaboration etc.
- Saudi Arabia hosts a 2.6 million Indian community that sends home remittances of \$11 billion or more annually.
- **Hence option (c) is the correct answer.**

Q 26.B

- The Reserve Bank of India (established in the year 1935 in accordance with the provisions of the Reserve Bank of India Act, 1934), is not just the monetary authority but also the highest supervisor and regulator of the banking system. It prescribes broad parameters of banking operations within which the country's banking and financial system functions such as issuing licenses, branch expansion, liquidity of assets, the amalgamation of banks, etc. In the given context, the seventy-year-old man uses two bank accounts for carrying out transactions, irrespective of the nature of the banks (private and public) they come under the purview of the Reserve Bank of India. **Hence option 1 is correct.**
- The Securities and Exchange Board of India (SEBI) is a statutory body established on April 12, 1992, in accordance with the provisions of the Securities and Exchange Board of India Act, 1992. The basic functions of the Securities and Exchange Board of India are to protect the interests of investors in securities and to promote and regulate the securities market. In the given context, the seventy-year-old man is trading on the intraday platform (which involves speculation in securities, specifically buying and selling financial instruments within the same trading day) which comes under the purview of the SEBI. **Hence option 2 is correct.**
- The Telecom Regulatory Authority of India (TRAI) has come into being as a consequence of the opening up of the telecommunication sector to private operators. It was set up under the TRAI Act of 1997. It has the power
 - to recommend the need for and timing of introduction of new service providers and terms and conditions of the license to a service provider;
 - and to protect consumers' interest, monitor quality of services, inspect equipment used in networks and make recommendations about such equipment;
- The seventy-year-old man uses multiple apps to avail services e.g. a trading app, BHIM app, etc which further use mobile data or internet services (telecom services). Thus the mobile/internet service provider comes within the ambits of TRAI. **Hence option 3 is correct.**
- Insurance Regulatory and Development Authority of India or the IRDAI is the apex body responsible for regulating and developing the insurance industry in India. It is an autonomous body. Even though the individual in the given context might have availed insurance schemes, nothing as such is mentioned in the question statement. **Hence option 4 is not correct.**
- The interim PFRDA was established in 2003. This was to oversee the National Pension System (NPS) and regulate India's pensions sector. The interim PFRDA transitioned into the PFRDA with the passage of the Pension Fund Regulatory Development Authority (PFRDA) Act, 2013. In the given context, there is no mention of the individual using his pension funds. **Hence option 5 is not correct.**

Q 27.D

- The Flame-throated Bulbul is a member of the bulbul family of passerine birds. It is **endemic to the Western Ghats**, where it can often be found in scrubby foothill forest, as well as overgrown and degraded forest edge.
- The flame-throated bulbul, also called the Rubigula, was chosen as the mascot of the 36th National Games to be held in Goa, because it is the State bird of Goa. Its IUCN status is 'Least Concern'.

Q 28.A

- **The Genetic Engineering Appraisal Committee (GEAC)** functions in the **Ministry of Environment, Forest and Climate Change (MoEF&CC)**. It is responsible for the appraisal of activities involving large scale use of hazardous microorganisms and recombinants in research and industrial production from the environmental angle. The committee is also responsible for the appraisal of proposals relating to the release of **genetically engineered (GE) organisms and products into the environment including experimental field trials**. GEAC is chaired by the Special Secretary/Additional Secretary of MoEF&CC and co-chaired by a representative from the Department of Biotechnology (DBT). **Hence statement 1 is correct.**
- There is a well established regulatory framework for approval of GM Crops as per **"Rules for the Manufacture/Use/Import/Export and Storage of Hazardous Microorganisms, Genetically Engineered Organisms or Cells, 1989" under the Environment (Protection) Act, 1986 in the Country**. Evaluation of each application of GM crop is done on a case-to-case basis after a thorough examination of health, environment, food and feed safety assessment studies undertaken in a systematic and scientific manner as per prescribed guidelines, manuals and standard operating procedures stipulated by various regulatory agencies under the Rules, 1989 from time to time. **Hence statement 2 is not correct.**

Q 29.A

- India enjoys an important position in the global pharmaceuticals sector. It is the largest provider of generic medicines globally, occupying a 20% share in global supply by volume, and also supplies 50% of global demand for vaccines the largest in the world.
- **India ranks 3rd worldwide for production by volume and 13th by value**, thereby accounting for around 10% of the world's production by volume and 1.5% by value. **Hence statement 1 is not correct.**
- The pharmaceutical industry was valued at \$ 36.7 bn in 2018. The market is expected to expand at a CAGR of 22.4% over 2015–20 to reach \$ 55 billion. India's pharmaceutical exports stood at US\$ 17.27 billion in FY18 and have reached US\$ 19.14 billion in FY19. Pharmaceutical exports include bulk drugs, intermediates, drug formulations, biologicals, Ayush & herbal products and surgical.
- Generic drugs, with 71% market share, form the largest segment of the Pharmaceutical industry in India. This is set to grow as exports of generics to the US rise, as branded drugs worth US\$ 55 billion will become off-patent during 2017-2019. **Hence statement 2 is not correct.**
- India's biotechnology industry comprising bio-pharmaceuticals, bio-services, bio-agriculture, bio-industry, and bioinformatics is expected to grow at an average growth rate of around 30 percent a year and reach US\$ 100 billion by 2025.
- Some of the initiatives taken by the government to promote the pharmaceutical sector in India are as follows:
 - The Drug Controller General of India (DCGI) announced its plans to start a single-window facility to provide consents, approvals and other information. The move is aimed at giving a push to the Make in India initiative.
 - The Government of India is planning to set up an electronic platform to regulate online pharmacies under a new policy, in order to stop any misuse due to easy availability.
 - The Government of India unveiled 'Pharma Vision 2020' aimed at making India a global leader in end-to-end drug manufacture. Approval time for new facilities has been reduced to boost investments.
 - The government introduced mechanisms such as the Drug Price Control Order and the National Pharmaceutical Pricing Authority to deal with the issue of affordability and availability of medicines.
 - 100% Foreign Direct Investment (FDI) is allowed under the automatic route for greenfield pharma, whereas in brownfield pharma 74% is allowed under the automatic route and thereafter through government approval route. **Hence statement 3 is correct.**

Q 30.B

- Operation Twist is a move in which a central bank decides to **simultaneously buy long-dated securities while selling short-term securities**. This is the first time RBI has undertaken such an unconventional policy measure with the aim of flattening the yield curve by lowering longer-term rates to boost lending and growth.
- Operation Twist normally leads to lower longer-term yields, which will help boost the economy by making loans less expensive for those looking to buy homes, cars and finance projects, while saving becomes less desirable because it doesn't pay as much interest. **Hence statement 1 is not correct.**
- As the central bank buys more long-term security and sells off short term bonds, the bond yield i.e. the return an investor gets on his holding - comes down significantly. Since long-term bond yield (10-year government securities) is a key market interest rate, lower rates can help people avail more long-term loans. It also helps in bringing down overall borrowing costs for the government. **Hence, statement 2 is correct.**
- Lower long-term interest rates would **provide more liquidity to the market**. Anything that increases the demand for long-term government bonds puts downward pressure on the interest rate and less demand for bonds tends to put upward pressure on interest rates. **Hence, statement 3 is correct.**

Q 31.B

- Recently, **India celebrated the 640th birth anniversary of Saint Ravidas**. Ravidas was an Indian mystic poet-saint of the Bhakti movement during the 15th to 16th century CE.
- He is revered as "Guru Ravidas", in most of the North India and Deccan Region. He was born in and around 1450 C.E. during Lodhi Dynasty & died around 1520 C.E. His poems are included in Guru Granth Sahib. He is considered as a disciple of Ramananda. He is contemporary to Kabir, Meera, Guru Nanak Dev Ji.
- Ravidas taught removal of social divisions of caste and gender, and promoted unity in the pursuit of personal spiritual freedoms. He followed "nirguna" form of supreme being and discussed the comparisons with "saguna". He worshipped god as "Hari".
- **His theory propagated around a place of "Begumpura", which is a place where there is no sorrow. The place where Ravidas is worshipped is modeled around this theory of "Begumpura".**

32. Correct Option (a)

33. Correct Option: (b) Explanation: • Bisphenol A (BPA) is a chemical produced in large quantities for use primarily in the production of polycarbonate plastics and epoxy resins.

34. Correct Option: (d) Explanation: • Triclosan is an ingredient added to many consumer products intended to reduce or prevent bacterial contamination. It is added to some antibacterial soaps and body washes, toothpastes, and some cosmetics.

35. Correct Option (B) Explanation: • Statement 1 is incorrect: As per Section 33(7) of the RPA, one candidate can contest from a maximum of two constituencies (more constituencies were allowed until 1996 when the RPA was amended to set the cap at two constituencies). • Statement 3 is incorrect: If a candidate is contesting from more than one constituency, he has to lodge a separate return of election expenses for every election which he has contested. The election for each constituency is a separate election. (Refer : Section 77 of the Representation of People Act, 1951)

36. Correct option (B) Explanation: • Ocean water: 97.2 percent • Glaciers and other ice: 2.15 percent • Groundwater,: 0.61 percent • Fresh water lakes: 0.009 percent • Inland seas: 0.008 percent • Soil Moisture: 0.005 percent • Atmosphere: 0.001 percent • Rivers: 0.0001 percent.

37. Correct Option: (b) Explanation: • Statement 1 is incorrect: Moringa Oleifera is a medium-sized evergreen tree that is native to Africa and Asia. Also known as The Moringa Tree, the Drumstick Tree or The Miracle Tree. This is non-leguminous tree. • Statement 2 is incorrect: Tamarind, (Tamarindus indica), evergreen tree of the pea family (Fabaceae), native to tropical Africa.

38. Correct Option: (b) Explanation: Black cotton Soils • Black soils are derivatives of Deccan trap lava and are spread mostly across interior Gujarat, Maharashtra, Karnataka, and Madhya Pradesh on the Deccan lava plateau and the Malwa Plateau, where there is both moderate rainfall and underlying basaltic rock. • The Deccan trap, which is the source of the black soils, is a basaltic province formed during the hot spot volcanism when the Indian plate was above the Reunion island about 66 million years ago. • At that time, the less viscous Basaltic lava erupted through the fissures covering a vast area of about ten lakh sq km. Hence option (b) is correct. • These soils are also known as the 'Regur Soil' or the 'Black Cotton Soil'.

39. Correct Option: (a)

40. Correct Option: (b) Explanation: • Adenoviruses are medium-sized, nonenveloped viruses with an icosahedral nucleocapsid containing a double stranded DNA genome. • Retroviruses are single-stranded RNA animal viruses that employ a double-stranded DNA intermediate for replication. • This is incorrect statement. <https://www.sciencedirect.com/topics/neuroscience/adenovirus-genome> • <https://www.ncbi.nlm.nih.gov/books/NBK21335/#:~:text=Retroviruses%20are%20single%2Dstranded%20RNA,by%20the%20enzyme%20reverse%20transcriptase.> • Adenoviruses are a group of viruses that typically cause respiratory illnesses, such as a common cold, conjunctivitis (an infection in the eye that is sometimes called pink

eye), croup, bronchitis, or pneumonia. • The human immunodeficiency virus (HIV) is grouped to the genus *Lentivirus* within the family of *Retroviridae*. • This is correct statement

41. Correct Option: (b) Explanation: • Police Custody means that police have the physical custody of the accused while Judicial Custody means an accused is in the custody of the concerned Magistrate. In the former, the accused is lodged in a police station lockup while in latter, it is the jail. So, statement 1 is incorrect. • When Police take a person into custody, the Cr.P.C kicks-in and they were produced before a Magistrate within 24 hours of the arrest. • Police Custody with permission to interrogate • During Judicial Custody, the police officer in charge of the case is not allowed to interrogate the suspect. However, the court may allow the interrogations to be conducted if it opines the interrogation being necessary under the facts produced before the court. So, statement 2 is correct. And, Option (b) is correct.

42. Correct Option: (b) Explanation: • The provision of Parole is a privilege/concession but not a right of any convicted prisoner. Hence, statement 1 is incorrect. □ States do have separate prison/parole rules because “prison and persons detained” is a state subject of the 7th schedule. So, statement 2 is correct. • And, Option (b) is correct.

43. Correct Option: (d) Explanation: Forest Rights Act, 2006 • The Forest Rights Act (FRA), 2006 recognizes the rights of the forest dwelling tribal communities and other traditional forest dwellers to forest resources, on which these communities were dependent for a variety of needs, including livelihood, habitation and other socio-cultural needs. The forest management policies, including the Acts, Rules and Forest Policies of Participatory Forest Management policies in both colonial and post-colonial India, did not, till the enactment of this Act, recognize the symbiotic relationship of the STs with the forests, reflected in their dependence on the forest as well as in their traditional wisdom regarding conservation of the forests. • The Ministry of the Central Government dealing with Tribal Affairs or any officer or authority authorised by the Central Government on this behalf shall be the nodal agency for the implementation of the provisions of this Act. Hence, option (d) is correct.

44. Correct Option: (a) Explanation: • The court exercises control over delegation of discretionary powers to the administration by adjudicating upon the constitutionality of the law under which such powers are delegated with reference to the fundamental rights enunciated in Part III of the Indian Constitution. Therefore, if the law confers vague and wide discretionary power on any administrative authority, it may be declared ultra vires Article 14, Article 19 and other provisions of the Constitution. • Article 14 of the Constitution guarantees equality before law but the courts have permitted reasonable classification to be made. Where the law is valid under the article, a discriminatory action would still be violative of the equality clause. • Hence, option (a) is correct. • Also, by elimination, Art. 28, and Art.44 are unrelated to the question and Art. 44 is to protect the FR of the citizens

45. Correct Option: (a) Explanation: • The Citizenship Act offers other categories of citizenship like Citizenship by Registration (Section 5) and Citizenship by Naturalisation (Section 6). These are basically for foreigners who wish to settle in

India and seek Indian citizenship or persons of Indian origin living abroad who want to return to India and live as citizens in this country. It says that if the registration or certificate of naturalization was obtained by “means of fraud, false representation or the concealment of a material fact; or that citizen has shown himself by act or speech to be disloyal or disaffected towards the Constitution of India as by law established; or that citizen has, during any war in which India may be engaged, unlawfully traded or communicated with an enemy; or that citizen has been ordinarily resident out of India for a continuous period of seven years”, that person’s citizenship can be cancelled.

46. Correct Option: (b)

47. Correct Option: (b) Explanation: • Statement 1 is incorrect: More than 80 percent of palm oil is grown in Southeast Asia, with Indonesia and Malaysia leading the world in production of the commodity. Oil palms were introduced to Malaysia and Indonesia in the mid-20th century from Africa, and large scale production followed. The growth has been rapid and widespread, and the natural forest and all that live in it face a dire future. • Statement 2 is correct: Palm oil and its derivatives are present in at least 70% of cosmetic products, according to Croda, a global specialty ingredients supplier to the beauty and personal care industry. This goes to show that palm-derived ingredients are preferred by the manufacturers for their functional benefits. • Statement 3 is correct: Generally, RBD palm oil is used to produce biodiesel due to the low FFA content (0.1-0.5%) and thus minimize the impact of saponification reaction. Darnoko and Cheryan (2000) studied the transesterification of RBD palm oil with methanol catalyzed by KOH.

48. Correct Option: (d) Explanation: • Didwana is a town in the Nagaur district of Rajasthan. It also has a famous Didwana salt-water lake of Rajasthan. • Kuchaman lake is a continental saline lake located around Kuchaman city, Nagaur District, Rajasthan.

49. Correct Option: (b) Explanation: • Statement 1 is incorrect: With the establishment of the United Nations Convention on the Law of the Sea in 1982 and the entry into force of the ISA in 1994, exploration activities for mineral resources in the area began to be regulated under exploration contracts. Originally, exploration activities were predominantly undertaken by national agencies, until 2010, when private companies became involved and a polymetallic-nodule-mining industry was born. □ Statement 2 is correct: India’s exclusive rights to explore polymetallic nodules from seabed in the Central Indian Ocean Basin (CIOB) have been extended by five years. These rights are over 75000 sq. km of area in international waters allocated by the International Seabed Authority for developmental activities for polymetallic nodules. • Statement 3 is correct: In 1972, a young ecologist named Hjalmar Thiel ventured to a remote part of the Pacific Ocean known as the Clarion–Clipperton Zone (CCZ). The seafloor there boasts one of the world’s largest untapped collections of rare-earth elements. Some 4,000 meters below the ocean surface, the abyssal ooze of the CCZ holds trillions of polymetallic nodules — potato-sized deposits loaded with copper, nickel, manganese, and other precious ores.

50. Correct Option: D Explanation: • Statement 1 is correct: Furnace oil or fuel oil is a dark viscous residual fuel obtained by blending mainly heavier components from crude distillation unit, short residue and clarified oil from fluidized catalytic cracker unit. • Statement 2 is

correct: It is used primarily for steam boilers in power plants, aboard ships, and in industrial plants.

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